1846MNRAS...7...64.

M. L. F. Ménabréa.
The Duke of Northumberland.
M. A. Oertling.
Professor Quetelet.
C. Rumker, Esq.
W. Rutherford, Esq.
Lieut.-Col. Sabine.
Professor Santini.
Professor Schumacher.
Rev. R. Sheepshanks.
H. H. Sherwood, Esq.
Capt. W. H. Smyth.
R. Snow, Esq.
Lieut. W. S. Stratford.
R. Taylor, Esq.
Rev. C. Turnor.
B. L. Vulliamy, Esq.
J. Wallace, Esq.

The President (Capt. W. H. Smyth, R.N.) then addressed the Meeting on the subject of the award of the Medal, as follows:

The Report, Gentlemen, which you have just heard, has acquainted you that your Council have awarded the Medal of this Society to Mr. Airy, the energetic Astronomer Royal, for his reductions of the Planetary Observations made at Greenwich between the years 1750 and 1830, by which an immense magazine of dormant facts, contained in the annals of the Royal Observatory, are rendered available to astronomical use. It may be proper, in expressing the grounds of this adjudication, to allude to the extensive nature and elevated character of that extraordinary work, as well as to the peculiar incidents connected with its production, which have brought it within the recognition of your Council.

It is, of course, understood, and has always been acted upon, that work, however excellent and useful, does not enter into competition when it only follows the necessary duty of the author. Our medal was primarily instituted as a mark of approbation on individual exertion, on labours of love; and not to note our sense of the official merits of public men, or of the rectitude and ability with which they may acquit themselves in their respective offices. Now the weighty reductions in question come before us as executed, at the expense of her Majesty's Government, by the Astronomer Royal. It remains, however, to be added, that the undertaking was proposed by that distinguished individual long before his appointment to Greenwich. After his attention had been particularly called to the planetary theory, by his taking charge of the Cambridge Observatory,—having already investigated the errors of the Solar Tables and the long inequality due to *Venus*,—he saw the immediate necessity of a complete computation of all the older *exact* observations, which is nearly equivalent to saying of those made at Greenwich since the erection of the new transit instrument by Bradley in September 1750, and no others. The importance of this object does not seem to have struck the authorities on Mr. Airy's first proposal; but after the British Association was formed, a deputation of that body waited upon the Chancellor of the Exchequer in 1833, and obtained his consent to defray the necessary expenses. Mr. Airy's offer was, that if the Government would meet the cost of reduction and printing, he would undertake the entire preparation and supervision of the work gratuitously; so that he undeniably has the merit of originating, pressing, carrying the proposal into successful operation, and bringing it to a most satisfactory conclusion, almost solely and exclusively, and without any pecuniary advantage or official call. The publication of the Reductions was ordered by the Lords Commissioners of the Admiralty, in consequence of a recommendation made to them by the Board of Visitors of the Royal Observatory of Greenwich, on the 25th of June, 1841.

This is the real origin of the reductions, and we find displayed in the execution of the task qualities of a higher order than that mere zealous and patient perseverance so often consumed in the mechanical department of computation. For raised as he was by his own talents and application to an almost unrivalled height over the field of astronomy, Mr. Airy was not only able to take in at one view the actual existing state of the science, but could also look back and trace all the wanderings of former inquirers, each proceeding in his own narrow foot-path according to his own peculiar views of the various constants of refraction, nutation, aberration, and other elements of reduction. Through this wilderness he cut a broad highway, connecting all those separate labours, and making each of them serviceable to the common end; as when a drain is cut through a marshy soil, and the waters of numberless useless pools are collected and led into one straight channel, which carries the improver through the before impracticable region, ready to apply his whole energy on the space beyond. But although much of this may be said of the Greenwich documents, still the original observations were so fairly and fully stated, and are so completely preserved, that they now admit of reduction with the same exactness as at the time when they were made. Still it is by no means a simple task to make one's self conversant, not only with the merits, but with all the peculiarities, the weaknesses, and the failings of both instruments and observers for a period of eighty years, as the Astronomer Royal has done.

The contents of this precious work are comprised in a quarto volume of above 700 pages, excellently printed, and divided into five sections. The first is devoted to the ascertaining of the clock errors, comprising the intervals of the wires, corrections for imperfect transits, and the position of the instrument, the effects of personal equation, and the rules by which the fundamental and determining stars were chosen; the second section contains the investigation of index errors and zenith points of the mural quadrants and circles; the third exhibits the computation of the geocentric places of the planets, as deduced from actual observations; the fourth shews the computation of the geocentric places of the planets, from the best existing tables of each of the bodies; and the fifth section gives the comparison of the observed with the tabular places, and expressions for the discordances in terms of the heliocentric errors of the earth and planets. These

1846MNRAS...7...64.

sections are briefly yet luminously described in an introduction of only thirty-four pages: but, though short, it would be difficult to name another specimen of astronomical writing of equal clearness and excellence. There are then twenty pages of the errata detected, either in the published volumes of the *Greenwich Observations*, or in the fundamental tables on which the planetary computations are founded; and the book concludes with nineteen skeleton forms of the schemes employed in reducing the matter. The whole is so lucidly and methodically arranged, that any one with a very moderate amount of elementary knowledge can take up an observation, and conduct the process to the end; for he will be able to check every important step in the result by a reference to the volume itself, to the formulæ, and to the skeleton forms.

But if I may venture to express my opinion on this point, I would add, that it is very improbable that a casual examination of the steps of the processes should produce any useful result beyond that of gratifying a laudable curiosity, or familiarising the student with calculations and investigations of this kind. In all cases of doubt, the original documents have been consulted, and every effort which great experience and singular acuteness could suggest, has been made to clear up the mistakes which will always be found in large quantities of observation. The mode of exhibiting the results is a great safeguard against errors of computation, and in passing through the press every portion of the work has been subjected to a most scrupulous revisal. The advantage of accuracy need not be insisted upon here, and I feel confident that the present book approaches in this respect as near perfection as, humanly speaking, that limit can be attained.

Such is the work which your Council have considered it their duty thus to appreciate. The masses of results obtained by this operose application of thought and labour may be likened to the extraction of ore from the dross of an ancient furnace; and I am gratified in having already had the satisfaction of publicly expressing my high sense of the vast importance of the task. Every stage of the undertaking has stamped the Astronomer Royal as being fully in command of the whole process; and in exhibiting the rare union of large conception, profound learning, and painstaking practice, prove him worthy of being the leader of the astronomical establishments of the kingdom. From the well-directed exertion of such talents the scientific world now reaps the benefit of the enormous calculations before us, the whole utility of which cannot yet, probably, be specifically stated. But we know, that whatever improvement may be made in the theory or constants of any one of the planets, or of the earth, the effect will be shewn in its corresponding influence on the heliocentric places of the earth and planet. Now, the equations which connect the variations of these elements with errors found by observation are all tabulated and grouped ready for the geometer's use, without requiring him to look beyond the fifth section, and with a degree of precision which no single computer could ever hope to arrive at. And as in botany we assume a new era from the time when Linnæus reduced the disjointed facts and instances of his day into a methodical system, by which men were able to make themselves masters of every truth which had been discovered up to that period, and turn their attention to something certainly new and useful; so may we, perhaps, date a new epoch in planetary astronomy from the appearance of the great work before you, since the desiderata in this department of the science are rendered visible, and the necessity for exact instants, a greater refinement of methods, and more delicate observations made apparent.

(*The President then, delivering the Medal to Mr. Airy, addressed him in the following terms*):—

Mr. Airy,—I have great pleasure in presenting to you the Medal which has been so justly awarded by the Council, in recognition of your admirable zeal, ability, and judgment in carrying out the reductions of the Planetary Observations. And be assured of our earnest hope, that a long and happy life may enable you still to achieve successive astronomical triumphs.

The Meeting then proceeded to the Election of the Council for the ensuing Year, when the following Fellows were elected, viz.

President: Captain W. H. Smyth, R.N. K.S.F. D.C.L. F.R.S. —*Vice-Presidents:* Samuel H. Christie, Esq. M.A. F.R.S.; Bryan Donkin, Esq. F.R.S.; Thomas Galloway, Esq. M.A. F.R.S.; Rev. Robert Main, M.A.—*Treasurer:* George Bishop, Esq.—*Secretaries:* William Rutherford, Esq.; Rev. Richard Sheepshanks, M.A. F.R.S.—*Foreign Secretary:* Sir John F. W. Herschel, Bart. K.H. M.A. F.R.S.—*Council:* G. B. Airy, Esq. M.A. F.R.S. Astronomer Royal; Solomon M. Drach, Esq.; Rev. George Fisher, M.A. F.R.S.; John Russell Hind, Esq.; Manuel J. Johnson, Esq. M.A.; John Lee, Esq. LL.D. F.R.S.; Augustus De Morgan, Esq.; Edward Riddle, Esq.; William Simms, Esq.; Lieut. William S. Stratford, R.N. F.R.S.

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